CITY OF LEBANON
DEPARTMENT OF PUBLIC WORKS
193 Dartmouth College Highway
Lebanon, NH 03766

REQUEST FOR PROPOSALS (RFP)
Landfill Gas Utilization Project

1. General:

The City of Lebanon, New Hampshire (hereafter referred to as the CITY) is seeking the services of a qualified developer (hereafter referred to as the DEVELOPER) lawfully engaged in the provision of development services in the Unites States for a Landfill Gas Utilization Project. Potential developers interested in responding to this RFP (hereafter referred to as OFFERORS) should attend a mandatory site visit and respond to this request on or before the time due for submission.

The City shall entertain proposals from developers to either "Option1: Design/Build/Own/Operate" or "Option 2: Design/Build/Operate/City-Own". Following the receipt of Proposals, a review committee consisting primarily of City staff shall evaluate the Proposals and review for selection.

2. Proposal Submission:

In order to be considered responsive, Proposals must be submitted to: Department of Public Works, 193 Dartmouth College Highway, Lebanon, NH 03766, Attention: James Donison, P.E., Director of Public Works.

Proposals must be received no later than 4:00 PM on June 27, 2019 to be eligible for consideration by the City. The subject line shall read; "Proposal - City of Lebanon, NH Landfill Gas Utilization Project". Submit nine (9) copies of the proposal in paper and one digital "flashdrive" or compact disk with the proposal in PDF format.

The Developer shall be required to provide a 100% Payment Bond and a 100% Performance Bond for the value of the contract amount for any proposed construction of public buildings or other public works including for any equipment to be delivered to the City site and proposed to be owned by the City, consistent with NH RSA 447:16 prior to issuance of a contract with the City.

The Proposal shall not exceed twenty-five (25) pages, double sided (printed on both sides - preferred) or fifty (50) pages, single sided (printed on one side). Sectional dividers may be used and will not count towards the maximum number of pages allowed. The Proposal will include a clear table of contents addressing all of the requirements of the RFP.

3. Guidelines for Offerors:

It is the policy of the CITY that Contracts be awarded only to responsible Offerors. In order to qualify as responsible, an Offeror must meet the following standards as they relate to this request:

a. Have the adequate financial resources for performance or have the ability to obtain such resources as required during performance;

b. Have the necessary experience, organization, technical and professional qualifications, skills, equipment and facilities;

c. Be able to comply with the proposed or required time of completion or performance schedule;

d. Have a satisfactory record of performance and documented successful completion of similar projects. The Respondent shall demonstrate that they have completed a minimum of 3 similar projects over the last five years with the primary proposed equipment or similar equipment.

4. Timetable Highlights (see also section 17.8 below):

Site Visit:	Mandatory Attendance for Pre-proposal Site Visit & Meeting: **10:00 am (local time) on June 13, 2019**, at the municipal solid waste landfill at 370 Plainfield Road in Lebanon, New Hampshire (office & garage building).
Proposals:	Due: **June 27, 2019 at 4:00 P.M.** **Late proposals will not be accepted** **Proposals shall be valid for 90 days**
Selection:	On or about: **July 19, 2019 to September 4, 2019 including interviews if necessary (maximum of three anticipated)**
Work Schedule:	Project Operational: **No Later Than November 1, 2020 and earlier to the extent proposed and feasible.**

5. RFP Procurement Process:

This RFP is being issued pursuant to the process for Competitive Sealed Proposals under §02-203 of the City's Purchasing Policy that states the following:

6. Limitations:

This Request for Proposals does not commit the CITY to award a contract, to pay any costs incurred in the preparation of a response to this request, or to procure or contract for services or supplies.

The CITY reserves the right to accept or reject any or all proposals received as a result of this request, including the waiver of technical deficiencies, modify or revise this RFP, or to cancel in part or in its entirety this RFP, if it is in the best interest of the CITY to do so.

The CITY reserves the right to make inquiries regarding Offeror's qualifications and reputation

and other parties' experience with the equipment and processes proposed to be used in the project as it deems necessary to evaluate the proposal.

7. Revisions to or Questions about this Request for Proposals:

Any questions, clarifications, or inquiries concerning this RFP must be submitted via email to: james.donison@lebanonnh.gov and must be received by **James Donison, P.E., Director of Public Works,** no later than June 19, 2019, 4:00 PM in order to be considered. The questions and City responses will be posted on the City's website by close of business on June 20th. Any changes to this request for proposals will be provided to all Offerors of record, who may record their interest in responding to this RFP by emailing james.donison@lebanonnh.gov or by attending the mandatory site visit on June 13, 2019. Offerors should refrain from communicating about the substance of this RFP or responses to it, directly or indirectly, or attempting to do so, with members of the City of Lebanon DPW staff and City Councilors during the pendency of this RFP, except as otherwise provided herein (i.e. as allowed during the site visit/pre-proposal meeting, via email inquiries as described above, or during interviews or negotiations as provided herein).

8. Evaluation and Contract Award:

Award shall be made to the responsible Offeror whose proposal, including best and final offer, conforms to the solicitation and is determined to be the most advantageous to the City taking into consideration the evaluation factors, including price, and the relative importance of each. The evaluation factors, which may include information obtained from references, and relative importance or weight totaling 100%, are as follows:

1. Sufficiency of experience, organization, technical and professional qualifications, skills, equipment and facilities to execute the proposed project – 10%.
2. Adequacy of financial resources for performance or the ability to obtain such resources as required during performance for the proposed project and ability to comply with the proposed or required time of completion or performance schedule – 10%.
3. Satisfactory record of performance by the Offeror, including the proposed equipment, and documented successful completion of similar projects – 10%.
4. Financial value or net price or financial benefit to the City, including proposed and potential investments, costs, revenue, and savings to the City, taking into account the comparative probability of various financial results based on risks, uncertainty, and experience, including potential upside benefits and downside harms of projected financial outcomes – 60%.
5. Overall value to the City including conformity with City policies including outcomes and goals of the City's Master Plan such as the City's desired outcome of "relying upon as much local renewable energy as is possible" – 10%.

The award of a Contract for this project may be subject to final approval by the Lebanon City Council, including for any additional appropriations or bonding authority necessary to fund and execute the proposed project.

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Sections 10 through 18 and this RFP are shown for the information of Offerors, and will incorporated into the Terms and Conditions governing the Contract.

9. Insurance:

The Developer shall, at its sole expense, obtain and maintain the following types of insurance, with an insurance company licensed to do business in the State of New Hampshire with a financial rating of A- or better in "Best's Insurance Guide," and for the following minimum amounts:

	Coverage	Limits
A.	Workers' Compensation	Per New Hampshire Statute
B.	Employer's Liability Insurance	$1,000,000
C.	Comprehensive General Liability*	$1,000,000 per occurrence/ $2,000,000 in the aggregate
D.	Comprehensive Automobile Liability*	
	Bodily Injury	$1,000,000 per occurrence/
	Property Damage	$2,000,000 in the aggregate
E.	Comprehensive Liability* Umbrella Coverage	$5,000,000 in the aggregate

*Comprehensive Liability Insurance shall include coverage for all claims of personal injury, bodily injury, sickness, disease, or death (including coverage for acts and failures to act of the Developer's officials and employees), and broad form property damage (including loss of use resulting there from) and for completed operations.

Prior to the start of Work, the Developer shall provide Certificates of Insurance to the City showing policy coverage of all of the above types of insurance with the coverage and limits as indicated above and, thereafter, on an annual basis for the duration of this Contract and also at the termination of the Contract, as evidence that policies providing the required coverage, conditions and limits are in full force and effect for the required period of time. Such Certificates shall identify this Contract and contain provisions that coverage will not be cancelled or materially altered until at least thirty (30) days prior written notice has been given to the City.

The City, to include its officers, agents and employees, shall be named as an additional insured on all insurance required under this Agreement except for Professional Liability.

10. Payment Schedule:

The OFFEROR shall specify the recommended payment schedule as part of the proposal. The payment schedule will be incorporated into the Contract.

11. Dispute Resolution:

Any controversy arising out of or relating to this Contract or the breach hereof shall be resolved in the following manner:

First, the parties will attempt to resolve such disputes through direct negotiations between appropriate representatives of each party. Second, if such negotiations are not fully successful, the parties will attempt to resolve any remaining dispute by formal non-binding mediation conducted in accordance with rules and procedures to be agreed upon by the mediator and parties. Third, if any controversy arising out of or relating to this Contract remains unresolved after the above steps, it may be resolved by arbitration or by a judicial process at the Grafton County Superior Court. If the parties choose arbitration, they shall define and agree on the scope

of the disputed issue in writing and then select an arbitrator. In the event the parties are unable to agree on the issue and scope of dispute prior to submission to arbitration, the dispute will be resolved in court.

If there is agreement to proceed with arbitration, the arbitrator shall adopt appropriate arbitration rules similar to the American Arbitration Association or any other arbitration procedure. The place of arbitration shall be in Lebanon, New Hampshire. The arbitration hearing shall be held within thirty (30) days after the notice of arbitration is delivered by one party to the other party, unless otherwise agreed. In the event the parties are unable to agree on an arbitrator, application can be made to the Grafton County Superior Court under RSA Chapter 542. The arbitrator shall have the power to interpret any provision of the Contract contained herein but not the power to amend, reform or revise the Contract. Any errors of law in any award of an arbitrator shall be reviewable in an appeal to the superior court as if brought there in the first instance, in addition to those issues reviewable under RSA Chapter 542.

12. Termination by Default:

In the event the DEVELOPER shall fail to perform as required under this Contract, the CITY shall then give notice to the DEVELOPER in writing describing the default, the action to cure the default and the time within which the default is to be cured. If the DEVELOPER does not cure the default within the time prescribed by the CITY, then the CITY shall have the right to terminate this Contract by giving written notice to the DEVELOPER of the termination and specifying the effective date. In the event of the termination, all finished or unfinished documents, data, programs and reports prepared by the DEVELOPER shall, at the option of the CITY, become its property. If the contract is terminated by the CITY, the DEVELOPER will be paid an amount which bears the same ratio to the total compensation as the services covered by the Contract, less payments previously made and less payments made by the CITY to another contractor to complete the Contract.

13. Termination for Convenience of the CITY:

The CITY may terminate the Contract at any time by giving written notice to the DEVELOPER of such termination and specifying the effective date thereof, at least fifteen (15) days before the effective date of such termination. In that event, all finished or unfinished documents and materials, at the option of the CITY become its property. If the Contract is terminated by the CITY as provided herein, the DEVELOPER will be paid an amount which bears the same ratio to the total compensation as the services covered by the Contract, less payments previously made by the CITY.

14. Indemnification:

The DEVELOPER shall fully indemnify, defend (with counsel acceptable to the City), hold harmless and reimburse (collectively "indemnify" and "indemnification") the City and its employees, officers, representatives and agents (collectively "Indemnified Party") from and against any and all claims, demands, actions, suits, damages, losses (including without limitation, loss of use), settlements, judgments, liabilities, obligations, penalties or fines, defenses, proceedings, cost disbursements or expenses of any kind or nature whatsoever, including without limitation, attorneys' and experts' fees, investigative and discovery costs and court costs at all levels, which may at any time be imposed upon, incurred by, asserted

against, or awarded against the City, arising out of or resulting from the acts or omissions of the DEVELOPER related to its performance under this Contract. Without limiting the foregoing, any and all claims relating to personal injury, death, damage to property, defects in materials or workmanship, actual or alleged infringement of any patent, trademark, copyright (or application for any thereof), or of any other tangible or intangible personal or property right, or any actual or alleged violation of any applicable statute, ordinance, administrative order, rule or regulation, or decree of any court, shall be included in the indemnification hereunder. In the event DEVELOPER is requested but refuses to honor the indemnification obligations hereunder, DEVELOPER shall, in addition to all other obligations, pay to the City the cost of bringing any action at law or in equity, including but not limited to attorneys' fees, to enforce this indemnity. This obligation to indemnify as provided herein shall survive the termination or expiration of this Contract, and said obligation of indemnification shall not be limited or diminished by the presence or absence of insurance required hereunder, or otherwise. Notwithstanding the foregoing, nothing herein shall be deemed to constitute a waiver of any immunities of the City, which immunities are hereby reserved to the City.

15. Contract Agreement:

The Contract Agreement between the City of Lebanon and the DEVELOPER shall include (1) this Request for Proposals (RFP) and any amendments thereto, and (2) the DEVELOPER's proposal submitted in response to the RFP including any modifications that result thereto as a result of negotiations with the City. In the event of a conflict in language between the two documents referenced above, the provisions and requirements set forth and referenced in this Request for Proposals shall govern. However, the City of Lebanon reserves the right to clarify any contractual relationship in writing with the concurrence of the DEVELOPER, and such written clarification shall govern in case of conflict with the applicable requirements stated in the RFP or the DEVELOPER'S proposal. In all other matters not affected by the written clarification, if any, this Request for Proposals shall govern. The selected DEVELOPER is cautioned that their proposal shall be subject to acceptance without further clarification.

16. Scope of Project Proposals:

1. GENERAL INFORMATION AND PROPOSAL DOCUMENTS

A. The City of Lebanon is located along the east side of the Connecticut River in Grafton County, New Hampshire. The City of Lebanon, Department of Public Works operates a municipal solid waste landfill at 370 Plainfield Road in Lebanon, New Hampshire.

B. The landfill currently generates, collects, and flares approximately 350 standard cubic feet per minute (scfm) of landfill gas with an average methane content of approximately 45% to 47%. The City of Lebanon is seeking proposals for landfill gas utilization projects at the Lebanon Solid Waste Facility to convert the landfill gas to energy and generate revenue and/or savings for the City.

C. Landfill gas utilization projects to be considered may include, but are not limited to, the following: reciprocating engines or microturbines for electrical generation, the conversion of the landfill gas to renewable natural gas (RNG), or both.

D. Revenue and Cost Considerations: Proposals will be considered based on construction, operation and maintenance expenses and/or rates to paid under any proposed purchased power agreement (PPA), as well as direct revenue or savings to the City from the project. Direct revenues or savings (estimated) may include but are not limited to: $/kWh and $/kW (for electrical generation), $/dekatherm (RNG), lease payments, and increase in property taxes for privately owned facilities if constructed within the Lebanon municipality.

Each proposal should include a discussion of indirect revenue or savings expected to be generated or enabled by the proposed project. Indirect revenues (estimated) include, but are not limited to: Renewable Energy Certificates (RECs) and Renewable Identification Numbers (RINs). . The discussion should include the current programs in place, the current guaranteed length of the program, the probability that the program will be extended, trend in market average of $/unit over the last 3 years, and projected market direction of $/unit

The City will entertain proposals where the Offeror designs, constructs, owns, and operates the facility as well as proposals where the City is responsible for funding construction and equipment purchases, owns the facility, as further described below.

E. The proposals should be based on studies and testing results prepared for the City of Lebanon and listed below:

1. Landfill Gas Sampling Results prepared by Sanborn, Head & Associates, Inc., with the following dates: July 15, 2015, December 17, 2015, June 21, 2016, December 13, 2016, and June 21, 2017.
2. Lebanon Regional Solid Waste Facility Landfill Gas to Energy Feasibility Study prepared by Stantec Consulting Services, Inc.
3. Siloxane Testing Results prepared by Atmospheric Analysis & Consulting, Inc.
4. Conceptual Estimates of Certain Construction Costs for Electric Generation by Dubois & King, Inc., 2019, consultants to the City.

F. The selected Developer shall use the services of an architect and engineer(s) registered in the State of New Hampshire to provide a full set of construction documents including drawings and specifications to the extent construction of buildings or other structures are part of the proposal and be licensed to perform the project construction work. The work shall be completed and a lease and/or operations and maintenance agreement executed for the project in accordance with the attached contract documents listed below:

1. City of Lebanon Document #1
2. Cost Proposal Tables
3. Any and all Addendums and Requests for Information (RFIs) issued as part of this RFP.

G. Questions or clarifications in regard to the contract documents shall be made in the form of a Request for Information (RFI). Requests for Information will be received until 7 days prior to the date for receipt of bids in order to address any issues and distribute to bidders for possible adjustments prior to bid submittal. RFIs submitted after this deadline

will not be responded to. All questions pertaining to this project shall be submitted in the form of an RFI and shall be submitted to the project contact:

James Donison, P.E.
Director of Public Works
(603) 448-3112
James.Donison@lebanonnh.gov

H. The City has a limited amount of landfill gas that will be generated by the waste mass, then collected and conveyed to the proposed project. The amount has been estimated in the Feasibility Report identified in 1.E above. The proposed project should consider the numbers in the Feasibility Report to be approximate.

I. The proposed project will begin at the intersection of the existing gas header main and the fence that surrounds the existing gas flare station. Offerors should assume that the City will continue to maintain the gas collection system, including wellfield tuning and operation of the flare, although any special considerations for wellfield tuning should be described in the Proposal. The Developer will connect to the existing gas header main by installing a tee and any required fittings or valves to isolate the landfill's flare station and the proposed project. The intent would be to keep the existing gas flare station as a backup to the proposed project to help the facility maintain permit compliance. The Proposal should describe any proposed provisions to automatically divert excess gas to be flared in the event more gas is collected than can be processed and stored as RNG or combusted for electric generation, including in the event of forced outages from equipment malfunction or otherwise.

J. The City will consider all types of arrangements associated with the proposed projects. The City shall entertain proposals from developers to either "Option1: Design /Build /Own/ Operate" or "Option 2: Design/ Build/ Operate/ City-Own". The City is primarily interested in operation and maintenance agreements that include 24/7 monitoring, which may be done remotely, of any gas conditioning, processing, or generating equipment, to include material and labor for both scheduled and unscheduled maintenance and repair. While the City is particularly interested in maintenance agreements with fixed prices or known escalation factors that extend out for a full 20-year Contract term, the City is also interested in quotation options for shorter term maintenance agreements if they might be more advantageous to the City.

K. The City will only consider projects that can obtain local, state, and federal permits. The proposal shall include a statement indicating the proposed project will be in compliance with all local, state, and federal permit guidelines.

L. There is a **mandatory** pre-proposal meeting and site visit at the municipal solid waste landfill at 370 Plainfield Road in Lebanon, New Hampshire (office & maintenance garage building on the right upon entering).

2. PROJECT LOCATION

A. The City of Lebanon, Department of Public Works operates a municipal solid waste landfill at 370 Plainfield Road in Lebanon, New Hampshire. The project is intended to use land located on the same parcel as the existing landfill gas flare. However, the City will consider proposals that are located on property not owned by the City.

B. A Conceptual Site Plan has been provided in Attachment A for use in preparing a proposal. The Conceptual Site Plan identifies a potential location, adjacent to the existing gas flare station, where a proposed project could be located. As mentioned in 2.A, other locations and parcels will be considered by the City.

3. GAS UTILIZATION OPTIONS

A. The City is seeking proposals to convert the landfill gas—collected from the municipal solid waste landfill—to energy that would generate revenue and/or savings for the City. The City will consider any gas utilization project that uses technology with a proven history including, but not limited to, electric generation and/or production of renewable natural gas.

1. Electric Generation – The City has considered converting the landfill gas to electrical energy using reciprocating engines or microturbines. Granite State Electric, d.b.a. Liberty Utilities, provides electric distribution services (poles, wires and transformers) on the site adjacent to the proposed project area. Electric generation may also produce useful thermal energy that may be used to heat the office and garage facility at the landfill, which uses about 4,500 gallons of #2 hearing oil per year, the scale house, and potentially for other applications. Special considerations and options for electric generation are discussed in §17.3.B below. The electrical lines would need to be evaluated for their capacity to transmit the electricity generated by the proposed project. Any improvements to the electrical lines shall be included in the proposal.

2. Renewable Natural Gas (RNG) – The City has considered converting the landfill gas to RNG. Depending on the use, the RNG may need to be treated to the respective quality standard (i.e., if the RNG is to be used for residential or commercial heating or for transportation uses) and may need to be compressed for transportation. Proposals that include RNG options shall include a description of the method of transportation (vehicle or pipeline) and the proposed end user(s).

4. FINANCIAL BENEFITS/REVENUE SOURCES

A. Proposed projects may generate direct revenue or savings such as from the sale of electricity per megawatt-hour (MWh) or its use to offset City loads, or the sale of a volume of gas measured in dollars per dekatherm. Proposals shall include a description of the direct revenue sources to be realized by the project, estimated annual revenue, and the revenue split between the Developer and the City. The proposal shall include the proposed length of the Contract and any escalators in estimated or guaranteed revenues and costs.

B. Proposed projects may generate indirect revenue such as renewable energy certificates (RECs), including TRECs, or renewable identification numbers (RINs). Proposals shall

include a description of the indirect revenue sources, estimated annual revenue, and the proposed revenue split between the Developer and the City, if any. The proposal should discuss current programs in place, the current guaranteed or likely length of the program or any proposed contract for the sale or purchase of RINs or RECs, including any escalators in estimated revenue, trend and volatility in market average of $/unit over at least the last 3 years, and projected market direction of $/unit, all to the extent experienced, known, or forecast by the Offeror The proposal shall include the proposed length of the agreement, any escalators in estimated revenue, the length that current RECs and RINs program are guaranteed to be in effect, and the probability of the continuation of the programs. As mentioned above, indirect revenues will not be considered in the selection process. However, they will be negotiated with the selected Developer during the contract negotiation phase.

C. Proposed projects may reduce costs for the municipality or its residents. Reductions in costs to the municipality may include the reduction of or credit against electricity rates, including electrical transmission charges, reduction in capacity charges or tags for retail loads, or competitive rates for the use of RNG in residential or commercial heating. Proposals should provide a description of the reduction in costs, estimated annual savings, and the estimated duration of the savings. Reductions in costs will be treated the same as direct revenues discussed above.

D. Proposed projects may generate other direct revenue for the City. Other direct revenue may include an increase in the value of taxable property, resulting taxes, and lease or royalty payments to the City. Proposals shall include a description of these other indirect revenue sources and the estimated annual revenue throughout the length of the Contract.

5. SITE CONSIDERATIONS

A. The facility is an active landfill and material recycling facility. The construction of the proposed project shall not interrupt existing operations of the facility. If interruption is necessary, it will be coordinated with the landfill manager at least 48 hours in advance.

B. The Developer will restore disturbed surfaces that are not part of improved or constructed facilities to their condition at the start of construction.

C. The proposed facility will have sufficient access for emergency services. Access to the facility will be coordinated with the Lebanon Fire Department.

D. The facility is an active landfill and material recycling facility. The atmosphere at the landfill can be dusty and windy. Projects should consider extreme conditions for the site/region and provide facilities and/or products that can operate in such conditions.

E. Per discussions with the Lebanon Fire Department, all structures and equipment will be labeled in a manner that clearly indicates the potential hazards present. Appropriate audio and visual alarms on the fencing or outside of the facility will be coordinated with the Lebanon Fire Department.

6. PERMITTING

A. The Developer will provide the City's consultant with any and all project information required to obtain local, state, and federal permits. The Developer will be responsible for all such permit applications. Information provided may include, but is not limited to, the following:

1. Project location,
2. Building information – use, outline, square footage, height, elevation and sectional views,
3. Operations and maintenance information,
4. Any other information required for permitting, and
5. If requested, the Developer will attend any and all public hearings.

B. If there is any portion of the project that is not on the landfill property, and for any portion located on City property that is proposed to be owned by the Developer, the Developer will be responsible for all associated project fees, including design, engineering, permitting, and application fees. The City's consultant will provide site plan information for the landfill property only.

7. PROJECT CONTRACT

A. The intent of this proposal is to select a Developer that will construct, operate, and maintain the proposed project for the entire length of the Project Contract (Contract).

B. The City will entertain proposals where the Offeror designs, constructs, owns and operates the facility as will as where the Offeror designs, constructs and operates the facility with the City owning the facility.

C. The Contract will be for a term of 20 years unless there are compelling reasons proposed as to why a different term would be more advantageous for the City.

D. At the end of the project Contract, the Developer will be responsible for the decommissioning and removal of all equipment owned by the Developer. Concrete pads, paved or gravel surfaces, and landscaping features will be or become the property of the City at the end of the Contract in any case.

8. PROJECT SCHEDULE

A. Each Developer shall submit with their proposal a proposed project schedule consistent with the target dates outlined below. Should these target dates not be attainable, provide a revised preliminary target project schedule. This schedule should be a best estimate with adequate time included to compensate for normal weather-related delays common for the area the proposed project is planned for. Identify the number of anticipated weather days in your proposal.

Release of RFP	May 21, 2019
Mandatory Pre-Proposal Meeting	June 13, 2019
Final Day for Questions	June 19, 2019
Last Addendum or Response to Questions Issued	June 20, 2019
Proposal submission	June 27, 2019
Evaluate Proposals &Select Developer	July 1, 2019 to September 4, 2019

Execute Contract	August 9, 2019 to October 1, 2019
End of Permit Phase	October 1, 2019 to December 1, 2019
Start of Construction	November 1, 2019 to May 1, 2010
End of Construction	April 1, 2020 to October 1, 2020
Project Operational	May 1, 2020 to November 1, 2020

9. OWNERSHIP OF PROPOSALS SUBMITTED BY OFFERORS

A. All materials submitted by the Offerors shall become the property of the City of Lebanon. Any submitted materials claimed by Offeror to be exempt from public disclosure as "confidential, commercial, or financial information" pursuant to RSA 91-A:5, IV or otherwise should be identified as such with their original filing. If such information is the subject of a request for public inspection or disclosure the City will comply with RSA 91-A and weigh the public interest in disclosure against the Offeror's privacy and commercial interest claims to determine whether such records are exempt from disclosure or not. Materials determined by the City or a court of competent jurisdiction to be exempt from disclosure shall be kept confidential and will not be shared unless expressly authorized to do so by the respective Offeror.

B. The City of Lebanon requires that all information regarding this transaction remain confidential and not be discussed with anyone who is not associated with the pertinent people within your company or people that are directly related with your efforts to submit the requested proposal. No publicity or news releases pertaining to the RFP or project may be released by any firm or individuals associated with the project without prior written approval of the City of Lebanon.

10. FUTURE CONSIDERATIONS

A. Changes to the landfill gas collection and control system may temporarily or permanently increase or decrease the landfill gas that is generated and collected. The proposed project should be able to handle the changes in landfill gas flows.

B. The City is currently considering landfill expansion options. An expansion of the landfill operations, if permitted, may generate additional gas for the project. The proposed project should be able to expand operations as the landfill generates and collects higher landfill gas flows. Likewise, the ability to downscale the project if future gas flows are reduced significantly below the capacity of the project, including any reduction in charges for maintenance and operation, may be a consideration that Offerors address in their Proposals.

17. **Preparation of Proposal:**

Proposal must be signed by the OFFEROR or his authorized representative.

OFFEROR must provide a proposal on all items relevant to the project as proposed appearing on the proposal form, including any options offered for consideration, unless specifically provided for otherwise. Failure to include all relevant items may disqualify the proposal.

Unless otherwise stated in the proposal, quoted prices, costs, and payments identified shall remain in effect for a period of ninety (90) days after the date and initial time for receipt of Proposals.

A. Offeror fully understands that time is of the essence for this project and acknowledges the completion date.

B. Offeror fully understands all requirements specified in Section 17 of this Request For Proposals.

C. The Offeror fully understands that a 100% Payment Bond and a 100% Performance Bond for the value of any contract amount for construction of any public buildings or other public works shall be provided prior to issuance of the contract.

Proposal Submitted By:

Company: _____

Contact: _____

Address: _____

Phone / Fax #'s: _____

Email Address(es): _____

Proposal Submission Deadline:

June 27, 2019, 4:00 P.M.

END OF Request For Proposals DOCUMENT

Conceptual Estimates of Certain Construction Costs for Electric Generation
by Dubois & King, Inc., 2019 for City of Lebanon Landfill Gas Utilization Project

CONSTRUCTION COST		Date:
Project:	Lebanon Landfill LFGTE Project	
Engineer:	DuBois & King, Inc.	
Subject:	Lebanon Landfill LFGTE Construction Costs	Sheet: 1

Type of LFG Utilization Project:

Category Item Description	Unit Cost	Unit Meas.	No. Units	Total	**Total Cost**
Gas Treatment					
Gas Processing, including blower, knockout tank w demister, heat exchanger/cooler					
H2S Removal					
Siloxane Removal					
CO2/O2/N2 Removal					
Oxidation Catalyst					
Extra Blower					
Flare/Thermal Oxidizer					
Complete Gas Treatment Skid					
Compression for Storage Tank					
Storage Tanks					
Electrical Generators (Reciprocating Engine, Microturbine, etc.)					
Installation Cost					
Building					
Building Cost					
Building Electrical Service					
Cabling within Building to Treatment/Generator					
Exterior Electrical Equipment					
Cabling					
Equipment					
Utility Poles					
Underground HV Service					
Transformer					
Controls					
Installation Cost					
Site Work					
Gas Conveyance, including piping and valves					
Hot Water, including supply/return, valves, plumbing					
Pavement					
Landscaping					
Stormwater Conveyance and Treatment					
Subtotal Construction Costs					
Permitting					
Interconnection Permit					
State Alteration of Terrain Permit					
Local Zoning Permit					
Mobilization/Demobilization					
Contractor Markup					
Total Construction Costs					

Notes:

OPERATION AND MAINTENANCE COSTS		Date:
Project:	Lebanon Landfill LFGTE Project	
Engineer:	DuBois & King, Inc.	
Subject:	Lebanon Landfill LFGTE O&M Costs	Sheet: 1

Type of LFG Utilization Project:

Category Item Description	Operation & Maintenance	Duration (hr/day)	Frequency (#/year)	Time (hr)/Year	Unit Cost	**Total Cost**
Gas Processing/Treatment						
Gas Processing, including blower, knockout tank w demister, heat exchanger/cooler	Daily Maintenance					
	Weekly Maintenance					
	Monthly Maintenance					
	Semi-Annual Maintenance					
	Annual Maintenance					
	Bi-Annual Maintenance					
	Other Maintenance					
H2S Removal	Media Change Out					
Siloxane Removal	Daily Maintenance					
	Weekly Maintenance					
	Monthly Maintenance					
	Semi-Annual Maintenance					
	Annual Maintenance					
	Bi-Annual Maintenance					
	Other Maintenance					
CO2/N2 Removal	Daily Maintenance					
	Weekly Maintenance					
	Monthly Maintenance					
	Semi-Annual Maintenance					
	Annual Maintenance					
	Bi-Annual Maintenance					
	Other Maintenance					
Oxidation Catalyst	Maintenance					
Flare/Thermal Oxidizer	Daily Maintenance					
	Weekly Maintenance					
	Monthly Maintenance					
	Semi-Annual Maintenance					
	Annual Maintenance					
	Bi-Annual Maintenance					
	Other Maintenance					
Complete Gas Treatment Skid	Daily Maintenance					
	Weekly Maintenance					
	Monthly Maintenance					
	Semi-Annual Maintenance					
	Annual Maintenance					
	Bi-Annual Maintenance					
	Other Maintenance					
Compression for Storage Tank	Daily Maintenance					
	Weekly Maintenance					
	Monthly Maintenance					
	Semi-Annual Maintenance					
	Annual Maintenance					
	Bi-Annual Maintenance					
	Other Maintenance					
Storage Tanks	Daily Maintenance					
	Weekly Maintenance					
	Monthly Maintenance					
	Semi-Annual Maintenance					
	Annual Maintenance					
	Bi-Annual Maintenance					
	Other Maintenance					
Electrical Generators (Reciprocating Engine, Microturbine, etc.)	Daily Maintenance					
	Weekly Maintenance					
	Monthly Maintenance					
	Semi-Annual Maintenance					
	Annual Maintenance					
	Bi-Annual Maintenance					
	Other Maintenance					
Average Subtotal Cost per Year						
Personnel						
Operator(s)						
Average Total Cost per Year						

Notes:

OPINION OF PROBABLE CONSTRUCTION COST		Date: 21-Feb-19
Project:		
Engineer:	DuBois & King, Inc.	
Subject:	Lebanon Landfill LFGTE Construction Costs	Sheet: 1

Please note that DuBois & King, Inc has no control over the cost of labor, material, and equipment, or over competitive bidding or market conditions within the State of New Hampshire. Therefore we do not guarantee the accuracy of our project or construction cost estimates as compared to actual contractor bids or the actual cost to the Client. This is understood to be an opinion of a probable budget. If a more accurate budget is required, we recommend enlisting the services of a professional estimating agency.

				Untreated Pipeline [6] (to Liberty Utilities)			1000 kW Engine			1000 kW Engine w/ CHP			(2) 500 kW Engine			(2) 500 kW Engine w CHP			(3) 333 kW MicroTurbine CHP Complete			Capstone 800kW MicroTurbine CHP Complete [3]			Pipeline Opt. 1 (to Liberty Utilities or Other)			Pipeline Opt. 2 (Unison Treatment)			Pipeline Opt. 3 (Xebec Treatment)			CNG Opt. 1 (to Liberty Utilities)			CNG Opt. 2 (Unison Treatment)			CNG Opt. 3 (Xebec Treatment)		
Category				Costs		Total	Costs		Total	Costs		Total	Costs		Total	Costs		Total	Costs		Total	Costs		Total	Costs		Total	Costs		Total	Costs		Total	Costs		Total	Costs		Total	Costs		Total
Sub-Category	Item Description	Unit Cost	Unit Meas.	No. Units	Total	Cost	No. Units	Total	Cost	No. Units	Total	Cost	No. Units	Total	Cost	No. Units	Total	Cost	No. Units	Total	Cost	No. Units	Total	Cost	No. Units	Total	Cost	No. Units	Total	Cost	No. Units	Total	Cost	No. Units	Total	Cost	No. Units	Total	Cost	No. Units	Total	Cost
Gas Processing/Treatment																																										
	Tedom System, includes blower, knockout tank w demister, heat exchanger/cooler	$160,000.00	ls				1	$160,000	$160,000	1	$160,000	$160,000	1	$160,000	$160,000	1	$160,000	$160,000	1	$160,000	$160,000				1	$160,000	$160,000							1	$160,000	$160,000						
H2S Removal																																										
	Sulfa Treat	$106,000.00	ea				1	$106,000	$106,000	1	$106,000	$106,000	1	$106,000	$106,000	1	$106,000	$106,000	1	$106,000	$106,000				1	$106,000	$106,000							1	$106,000	$106,000						
Siloxane Removal																																										
	Willexa System	$295,000.00	ea				1	$295,000	$295,000	1	$295,000	$295,000	1	$295,000	$295,000	1	$295,000	$295,000	1	$295,000	$295,000				1	$295,000	$295,000							1	$295,000	$295,000						
CO2/O2/N2 Removal																																										
	PSA Treatment	$1,500,000.00	ea																						1	$1,500,000	$1,500,000							1	$1,500,000	$1,500,000						
Oxidation Catalyst																																										
	TBD	$10,000.00	ea				1	$10,000	$10,000	1	$10,000	$10,000	1	$10,000	$10,000	1	$10,000	$10,000	1	$10,000	$10,000				0	$0	$0															
Extra Blower																																										
	Tedom Blower	$36,300.00	ea																						1	$36,300	$36,300															
Flare/Thermal Oxidizer																																										
	Willexa Thermal Oxidizer	$150,000.00	ea				1	$150,000	$150,000	1	$150,000	$150,000	1	$150,000	$150,000	1	$150,000	$150,000	1	$150,000	$150,000				1	$150,000	$150,000							1	$150,000	$150,000						
Unison Solutions																																										
	Gas Treatment Skid [3,4]	Varies	ls																			1	$780,000	$780,000				1	$3,500,000	$3,500,000							1	$4,000,000	$4,000,000			
Xebec																																										
	Gas Treatment Skid [5]	$4,500,000.00	ls																												1	$4,500,000	$4,500,000							1	$4,500,000	$4,500,000
Compression																																										
	Tank Compression	$320,000.00	ea																															1	$320,000	$320,000	1	$320,000	$320,000	1	$320,000	$320,000
Storage																																										
	Storage Tanks	$160,000.00	ea																															1	$160,000	$160,000	1	$160,000	$160,000	1	$160,000	$160,000
Conveyance																																										
	In-Line Condensate Trap(s)	$25,000.00	ea																						2	$50,000	$50,000	2	$50,000	$50,000	2	$50,000	$50,000									
Generators																																										
	1000 KW Biogas Engine Unit With Gear	$850,000	ea				1	$850,000	$850,000																																	
	1000 KW Biogas CHP Engine Unit Complete	$930,000	ea							1	$930,000	$930,000																															
	500 KW BioGAS Engine Unit with Gear	$450,000	ea										2	$900,000	$900,000																											
	500 KW BioGAS CHP Engine Unit Complete	$580,000	ea													2	$1,160,000	$1,160,000																									
	Micro Turbine 330 KW CHP Complete	$425,000	ea																3	$1,275,000	$1,275,000																					
	Capstone 800 kW MicroTurbine [3]	$1,149,400	ea																																							
	Capstone 800 kW MicroTurbine CHP Complete [3]	$1,218,500	ea																																							
Installation																																										
	Installation (Assumed 10% of Equipment Cost)		ls				1	$157,100	$157,100	1	$165,100	$165,100	1	$162,100	$162,100	1	$188,100	$188,100	1	$199,600	$199,600	1	$199,850	$199,900	1	$229,730	$229,700	1	$355,000	$355,000	1	$455,000	$455,000	1	$269,100	$269,100	1	$448,000	$448,000	1	$498,000	$498,000
Building																																										
	Building	$200.00	per sq ft				4000	$800,000	$800,000	4000	$800,000	$800,000	4000	$800,000	$800,000	4000	$800,000	$800,000	4100	$820,000	$820,000				3900	$780,000	$780,000							3900	$780,000	$780,000						
Building Electrical Service																																										
Cabling to Building/Generator/Treatment																																										
	1600 Amp, 600Kcmil wire	$250.00	lf				50	$12,500	$12,500	50	$12,500	$12,500	50	$12,500	$12,500	50	$12,500	$12,500	50	$12,500	$12,500	50	$12,500	$12,500	50	$12,500	$12,500	50	$12,500	$12,500	50	$12,500	$12,500	50	$12,500	$12,500	50	$12,500	$12,500	50	$12,500	$12,500
	Trenching with 4-4" PVC	$85.00	lf				30	$2,550	$2,600	30	$2,550	$2,600	30	$2,550	$2,600	30	$2,550	$2,600	30	$2,550	$2,600	30	$2,550	$2,600	30	$2,550	$2,600	30	$2,550	$2,600	30	$2,550	$2,600	30	$2,550	$2,600	30	$2,550	$2,600	30	$2,550	$2,600
Exterior Electrical Equipment																																										
Cabling																																										
	15 KV Cable	$13.50	lf				250	$3,380	$3,400	250	$3,380	$3,400	250	$3,380	$3,400	250	$3,380	$3,400	250	$3,380	$3,400	250	$3,380	$3,400	250	$3,380	$3,400	100	$1,350	$1,400	100	$1,350	$1,400	100	$1,350	$1,400	100	$1,350	$1,400	100	$1,350	$1,400
	Terminations	$515.00	ea				3	$1,550	$1,600	3	$1,550	$1,600	3	$1,550	$1,600	3	$1,550	$1,600	3	$1,550	$1,600	3	$1,550	$1,600	3	$1,550	$1,600	3	$1,550	$1,600	3	$1,550	$1,600	3	$1,550	$1,600	3	$1,550	$1,600	3	$1,550	$1,600
Equipment																																										
	15 KV Switch Assembly	$20,000.00	ea				1	$20,000	$20,000	1	$20,000	$20,000	1	$20,000	$20,000	1	$20,000	$20,000	1	$20,000	$20,000	1	$20,000	$20,000	1	$20,000	$20,000	1	$20,000	$20,000	1	$20,000	$20,000	1	$20,000	$20,000	1	$20,000	$20,000	1	$20,000	$20,000
	15 KV Surge Arresters	$2,200.00	ea				3	$6,600	$6,600	3	$6,600	$6,600	3	$6,600	$6,600	3	$6,600	$6,600	3	$6,600	$6,600	3	$6,600	$6,600	3	$6,600	$6,600	3	$6,600	$6,600	3	$6,600	$6,600	3	$6,600	$6,600	3	$6,600	$6,600	3	$6,600	$6,600
	15 KV Fuses	$2,825.00	ls				1	$2,830	$2,800	1	$2,830	$2,800	1	$2,830	$2,800	1	$2,830	$2,800	1	$2,830	$2,800	1	$2,830	$2,800	1	$2,830	$2,800	1	$2,830	$2,800	1	$2,830	$2,800	1	$2,830	$2,800	1	$2,830	$2,800	1	$2,830	$2,800
	Recloser	$25,000.00	ea				1	$25,000	$25,000	1	$25,000	$25,000	1	$25,000	$25,000	1	$25,000	$25,000	1	$25,000	$25,000	1	$25,000	$25,000	1	$25,000	$25,000	1	$25,000	$25,000	1	$25,000	$25,000	1	$25,000	$25,000	1	$25,000	$25,000	1	$25,000	$25,000
Utility Poles																																										
	Uility Poles With Cross Arms	$2,580.00	ls				2	$5,160	$5,200	2	$5,160	$5,200	2	$5,160	$5,200	2	$5,160	$5,200	2	$5,160	$5,200	2	$5,160	$5,200	1	$2,580	$2,600	1	$2,580	$2,600	1	$2,580	$2,600	1	$2,580	$2,600	1	$2,580	$2,600	1	$2,580	$2,600
	Insulators	$500.00	ea				6	$3,000	$3,000	6	$3,000	$3,000	6	$3,000	$3,000	6	$3,000	$3,000	6	$3,000	$3,000	6	$3,000	$3,000	3	$1,500	$1,500	3	$1,500	$1,500	3	$1,500	$1,500	3	$1,500	$1,500	3	$1,500	$1,500	3	$1,500	$1,500
Underground HV Service																																										
	15 KV #1/0 Wires	$25.00	lf				100	$2,500	$2,500	100	$2,500	$2,500	100	$2,500	$2,500	100	$2,500	$2,500	100	$2,500	$2,500	100	$2,500	$2,500																			
	Trench 2-4" PVC Concrete encased	$48.95	lf				30	$1,470	$1,500	30	$1,470	$1,500	30	$1,470	$1,500	30	$1,470	$1,500	30	$1,470	$1,500	30	$1,470	$1,500																			
Transformer																																										
	1000 KVA padmount	$33,000.00	ea				1	$33,000	$33,000	1	$33,000	$33,000	1	$33,000	$33,000	1	$33,000	$33,000	1	$33,000	$33,000	1	$33,000	$33,000																			
	500 KVA pole mount	$10,000.00	ea																						1	$10,000	$10,000	1	$10,000	$10,000	1	$10,000	$10,000	1	$10,000	$10,000	1	$10,000	$10,000	1	$10,000	$10,000
	Vault with covers	$10,000.00	ea				1	$10,000	$10,000	1	$10,000	$10,000	1	$10,000	$10,000	1	$10,000	$10,000	1	$10,000	$10,000	1	$10,000	$10,000																			
	Grounding and bonding	$5,000.00	ls				1	$5,000	$5,000	1	$5,000	$5,000	1	$5,000	$5,000	1	$5,000	$5,000	1	$5,000	$5,000	1	$5,000	$5,000	1	$5,000	$5,000	1	$5,000	$5,000	1	$5,000	$5,000	1	$5,000	$5,000	1	$5,000	$5,000	1	$5,000	$5,000
Controls																																										
	PLC Gas Conditioning System Control Panel	$50,000.00	ea																			1	$50,000	$50,000				1	$50,000	$50,000							1	$50,000	$50,000			
Installation																																										
	Installation (Assumed 10% Equipment Cost)		ls				1	$26,908	$26,900	1	$26,908	$26,900	1	$26,908	$26,900	1	$26,908	$26,900	1	$26,908	$26,900	1	$26,908	$26,900	1	$18,698	$18,700	1	$18,292	$18,300	1	$18,292	$18,300	1	$18,292	$18,300	1	$18,292	$18,300	1	$18,292	$18,300
Site Work																																										
Gas Conveyance																																										
	Gas Header to Building/Treatment from GCCS	$90.00	lf				250	$22,500	$22,500	250	$22,500	$22,500	250	$22,500	$22,500	250	$22,500	$22,500	250	$22,500	$22,500	250	$22,500	$22,500	250	$22,500	$22,500	250	$22,500	$22,500	250	$22,500	$22,500	250	$22,500	$22,500	250	$22,500	$22,500	250	$22,500	$22,500
	Gas Valves	$1,400.00	ea				2	$2,800	$2,800	2	$2,800	$2,800	2	$2,800	$2,800	2	$2,800	$2,800	2	$2,800	$2,800	2	$2,800	$2,800	3	$4,200	$4,200	2	$2,800	$2,800	2	$2,800	$2,800	3	$4,200	$4,200	2	$2,800	$2,800	2	$2,800	$2,800
	Gas Header from Building/Treatment to PL	$90.00	lf																						500	$45,000	$45,000	500	$45,000	$45,000	500	$45,000	$45,000								
Hot Water																																										
	Supply/Return to Maintenance Building	$40.00	lf				500	$20,000	$20,000	500	$20,000	$20,000	500	$20,000	$20,000	500	$20,000	$20,000	500	$20,000	$20,000	500	$20,000	$20,000																			
	Valves	$250.00	ea				2	$500	$500	2	$500	$500	2	$500	$500	2	$500	$500	2	$500	$500	2	$500	$500																			
	Plumbing/Interior Work	$5,000.00	ls				1	$5,000	$5,000	1	$5,000	$5,000	1	$5,000	$5,000	1	$5,000	$5,000	1	$5,000	$5,000	1	$5,000	$5,000																			
Paved Surfaces																																										
	Pavement	$50.00	sy				3000	$150,000	$150,000	3000	$150,000	$150,000	3000	$150,000	$150,000	3000	$150,000	$150,000	3000	$150,000	$150,000	500	$25,000	$25,000	3000	$150,000	$150,000	500	$25,000	$25,000	500	$25,000	$25,000	3000	$150,000	$150,000	500	$25,000	$25,000	500	$25,000	$25,000
Landscaping																																										
	Seed/Mulch	$1,000.00	ac				1	$1,000	$1,000	1	$1,000	$1,000	1	$1,000	$1,000	1	$1,000	$1,000	1	$1,000	$1,000	1	$1,000	$1,000	1	$1,000	$1,000	1	$1,000	$1,000	1	$1,000	$1,000	1	$1,000	$1,000	1	$1,000	$1,000	1	$1,000	$1,000
Stormwater																																										
	Stormwater Treatment	$50,000.00	ls				1	$50,000	$50,000	1	$50,000	$50,000	1	$50,000	$50,000	1	$50,000	$50,000	1	$50,000	$50,000				1	$50,000	$50,000							1	$50,000	$50,000						
Subtotal Construction Costs									**$2,941,500**			**$3,029,500**			**$2,996,500**			**$3,282,500**			**$3,429,000**			**$2,486,800**			**$3,692,000**			**$4,161,200**			**$5,211,200**			**$4,077,700**			**$5,139,200**			**$5,639,200**
Permitting																																										
	Interconnection Permit	$5,000.00	ls				1	$5,000	$5,000	1	$5,000	$5,000	1	$5,000	$5,000	1	$5,000	$5,000	1	$5,000	$5,000	1	$5,000	$5,000																			
	State Alteration of Terrain Permit	$5,000.00	ls				1	$5,000	$5,000	1	$5,000	$5,000	1	$5,000	$5,000	1	$5,000	$5,000	1	$5,000	$5,000	1	$5,000	$5,000	1	$5,000	$5,000	1	$5,000	$5,000	1	$5,000	$5,000	1	$5,000	$5,000	1	$5,000	$5,000	1	$5,000	$5,000
	Local Zoning Permit	$2,000.00	ls				1	$2,000	$2,000	1	$2,000	$2,000	1	$2,000	$2,000	1	$2,000	$2,000	1	$2,000	$2,000	1	$2,000	$2,000	1	$2,000	$2,000	1	$2,000	$2,000	1	$2,000	$2,000	1	$2,000	$2,000	1	$2,000	$2,000	1	$2,000	$2,000
Mobilization/Demobilization (Assumed 10% subtotal construction costs)			ls				1	$294,100	$294,100	1	$302,900	$302,900	1	$299,600	$299,600	1	$328,200	$328,200	1	$342,900	$342,900	1	$22,300	$22,300	1	$369,200	$369,200	1	$19,100	$19,100	1	$19,100	$19,100	1	$407,800	$407,800	1	$14,600	$14,600	1	$14,600	$14,600
Contractor Markup (Assumed 20% equipment/materials costs)			ls				1	$501,100	$501,100	1	$517,100	$517,100	1	$511,100	$511,100	1	$563,100	$563,100	1	$590,100	$590,100	1	$23,900	$23,900	1	$634,200	$634,200	1	$15,300	$15,300	1	$15,300	$15,300	1	$712,500	$712,500	1	$15,300	$15,300	1	$15,300	$15,300
Contingency (Assumed 20% subtotal construction costs)			ls				1	$588,300	$588,300	1	$605,900	$605,900	1	$599,300	$599,300	1	$656,500	$656,500	1	$685,800	$685,800	1	$44,600	$44,600	1	$738,400	$738,400	1	$38,200	$38,200	1	$38,200	$38,200	1	$815,500	$815,500	1	$29,200	$29,200	1	$29,200	$29,200
						$0			$4,337,000			$4,467,000			$4,419,000			$4,842,000			$5,060,000			$2,590,000			$5,441,000			$4,241,000			$5,291,000			$6,021,000			$5,205,000			$5,705,000
Total Construction Costs						**$0**			**$4,337,000**			**$4,467,000**			**$4,419,000**			**$4,842,000**			**$5,060,000**			**$2,590,000**			**$5,441,000**			**$4,241,000**			**$5,291,000**			**$6,021,000**			**$5,205,000**			**$5,705,000**

Notes:
1. CHP=Combined Heat Processes
2. Pipeline options do not include infrastructure beyond site entrance.
3. Capstone MicroTurbines and Treatment Equipment Costs includes Mob/Demob, Markup and Contingency, therefore those costs have only been evaluated for Electrical Equipment and Site Work.
4. Based on conversations with Unison Solution, treatment including CO2 Removal is approximately $2,500,000, but does not include O2 or N2 removal. Noted that O2/N2 removal will push price into $3,000,000 to $4,000,000 range depending on gas quality requirements.
5. Xebec System, includes compressor, filters, vacuum pumps, chiller, H2S removal, PSA. Delivery and installation supervision also included.
6. Untreated Pipeline Option assumes Liberty Utilities responsible for Construction Costs

OPINION OF PROBABLE OPERATION AND MAINTENANCE		Date:	21-Feb-19
Project:			
Engineer:	DuBois & King, Inc.		
Subject:	Lebanon Landfill LFGTE Maintenance Costs	Sheet:	1

Please note that DuBois & King, Inc has no control over the cost of labor, material, and equipment, or over competitive bidding or market conditions within the State of New Hampshire. Therefore we do not guarantee the accuracy of our project or construction cost estimates as compared to actual contractor bids or the actual cost to the Client. This is understood to be an opinion of a probable budget. If a more accurate budget is required, we recommend enlisting the services of a professional estimating agency.

				Untreated Pipeline (to Liberty Utilities) [6]					1000 kW Engine					1000 kW Engine w/ CHP					(2) 500 kW Engine					(2) 500 kW Engine w CHP					(3) 333 kW MicroTurbine					Capstone 800 kW MicroTurbine CHP Complete					Pipeline Opt. 1 (to Liberty Utilities or Other)					Pipeline Opt. 2 (Unison Treatment)					Pipeline Opt. 3 (Xebec Treatment)					CNG Opt. 1 (to Liberty Utilities)					CNG Opt. 2 (Unison Treatment)					CNG Opt. 3 (Xebec Treatment)				
Category								Total					Total					Total					Total					Total					Total					Total					Total					Total					Total					Total					Total					Total
Sub-Category	Item Description	Recommended Operation & Maintenance	Description	Duration (hr/day)	Frequency (#/year)	Time (hr)/Year	Unit Cost	Cost	Duration (hr/day)	Frequency (#/year)	Time (hr)/Year	Unit Cost	Cost	Duration (hr/day)	Frequency (#/year)	Time (hr)/Year	Unit Cost	Cost	Duration (hr/day)	Frequency (#/year)	Time (hr)/Year	Unit Cost	Cost	Duration (hr/day)	Frequency (#/year)	Time (hr)/Year	Unit Cost	Cost	Duration (hr/day)	Frequency (#/year)	Time (hr)/Year	Unit Cost	Cost	Duration (hr/day)	Frequency (#/year)	Time (hr)/Year	Unit Cost	Cost	Duration (hr/day)	Frequency (#/year)	Time (hr)/Year	Unit Cost	Cost	Duration (hr/day)	Frequency (#/year)	Time (hr)/Year	Unit Cost	Cost	Duration (hr/day)	Frequency (#/year)	Time (hr)/Year	Unit Cost	Cost	Duration (hr/day)	Frequency (#/year)	Time (hr)/Year	Unit Cost	Cost	Duration (hr/day)	Frequency (#/year)	Time (hr)/Year	Unit Cost	Cost	Duration (hr/day)	Frequency (#/year)	Time (hr)/Year	Unit Cost	Cost
Gas Processing/Treatment																																																																			
Gas Processing																																																																			
	Tedom System, includes blower, knockout tank w demister, heat exchanger/cooler																																																																		
		Monthly Maintenance	System Inspection						Operation and Maintenance Personnel to perform					Operation and Maintenance Personnel to perform					Operation and Maintenance Personnel to perform					Operation and Maintenance Personnel to perform					Operation and Maintenance Personnel to perform										Operation and Maintenance Personnel to perform															Operation and Maintenance Personnel to perform														
		Semi-Annual Maintenance	Gas Filter Cleaning and Blower Inspection						Operation and Maintenance Personnel to perform					Operation and Maintenance Personnel to perform					Operation and Maintenance Personnel to perform					Operation and Maintenance Personnel to perform					Operation and Maintenance Personnel to perform										Operation and Maintenance Personnel to perform															Operation and Maintenance Personnel to perform														
		Annual Maintenance	Gas Filter Cleaning, Process Valves, Blower, Heat Exchanger, Pressure Gauges, and Termocouple Inspections						8.00	1.00	8.00	$40	$320	8.00	1.00	8.00	$40	$320	8.00	1.00	8.00	$40	$320	8.00	1.00	8.00	$40	$320	8.00	1.00	8.00	$40	$320						8.00	1.00	8.00	$40	$320											8.00	1.00	8.00	$40	$320										
		Bi-Annual Maintenance	Gas Filter Cleaning, Process Valves, Blower, Heat Exchanger, Pressure Gauges, Termocouples Inspections, and Blower Bearings						24.00	0.50	12.00	$40	$480	24.00	0.50	12.00	$40	$480	24.00	0.50	12.00	$40	$480	24.00	0.50	12.00	$40	$480	24.00	0.50	12.00	$40	$480						24.00	0.50	12.00	$40	$480											24.00	0.50	12.00	$40	$480										
		5-Yr Maintenance	Blower Overhaul						40.00	0.20	8.00	$40	$320	40.00	0.20	8.00	$40	$320	40.00	0.20	8.00	$40	$320	40.00	0.20	8.00	$40	$320	40.00	0.20	8.00	$40	$320						40.00	0.20	8.00	$40	$320											40.00	0.20	8.00	$40	$320										
H2S Removal																																																																			
	Sulfa Treat																																																																		
		Bi-Annual Media Change Out	Labor, trucking, disposal, and replacement of media						8.00	0.50	0.50	$8,000	$4,000	8.00	0.50	0.50	$8,000	$4,000	8.00	0.50	0.50	$8,000	$4,000	8.00	0.50	0.50	$8,000	$4,000	8.00	0.50	0.50	$8,000	$4,000						8.00	0.50	0.50	$8,000	$4,000											8.00	0.50	0.50	$8,000	$4,000										
Siloxane Removal																																																																			
	Willexa System																																																																		
		Daily Maintenance	Alarms & Warnings, Filter Drain, Filter Valve, Blower Motor, Instrument Air						Operation and Maintenance Personnel to perform					Operation and Maintenance Personnel to perform					Operation and Maintenance Personnel to perform					Operation and Maintenance Personnel to perform					Operation and Maintenance Personnel to perform										Operation and Maintenance Personnel to perform															Operation and Maintenance Personnel to perform														
		Weekly Maintenance	Filter Elements, Blower Intake Filter, Blower Outlet Pressure Gauge, Heater Temp. Gauges, Blower Oil, Panel Heater & Air Conditioners						Operation and Maintenance Personnel to perform					Operation and Maintenance Personnel to perform					Operation and Maintenance Personnel to perform					Operation and Maintenance Personnel to perform					Operation and Maintenance Personnel to perform										Operation and Maintenance Personnel to perform															Operation and Maintenance Personnel to perform														
		Monthly Maintenance	Gas Quality, Heater Amp, Blower Drive Belt, Blower Grease						Operation and Maintenance Personnel to perform					Operation and Maintenance Personnel to perform					Operation and Maintenance Personnel to perform					Operation and Maintenance Personnel to perform					Operation and Maintenance Personnel to perform										Operation and Maintenance Personnel to perform															Operation and Maintenance Personnel to perform														
		Semi-Annual Maintenance	Control Panels, Heaters & Air Conditioner, Blower Oil, Blower Drive Belt, Blower Intake Filter, After Filter, and Carbon Media						8.00	2.00	16.00	$40	$640	8.00	2.00	16.00	$40	$640	8.00	2.00	16.00	$40	$640	8.00	2.00	16.00	$40	$640	8.00	2.00	16.00	$40	$640						8.00	2.00	16.00	$40	$640											8.00	2.00	16.00	$40	$640										
		Annual Maintenance	Process Valves, Solenoid Valves, Pressure Transmitter, RIDs & Termocouples, Pressure Relief Valves, Leaks, and Heater Connections						16.00	1.00	16.00	$40	$640	16.00	1.00	16.00	$40	$640	16.00	1.00	16.00	$40	$640	16.00	1.00	16.00	$40	$640	16.00	1.00	16.00	$40	$640						16.00	1.00	16.00	$40	$640											16.00	1.00	16.00	$40	$640										
		18-Month Maintenance	Media Replacement, Pre and Post Filter Elements						24.00	0.67	16.00	$40	$640	24.00	0.67	16.00	$40	$640	24.00	0.67	16.00	$40	$640	24.00	0.67	16.00	$40	$640	24.00	0.67	16.00	$40	$640						24.00	0.67	16.00	$40	$640											24.00	0.67	16.00	$40	$640										
CO2/N2 Removal																																																																			
	Xebec System																																																																		
		Annual Consumables	Preventative maintenance: media changeout and filter maintenance. Based on manufacturers estimated average annual cost.																																					1.00		$75,000	$75,000												1.00		$75,000	$75,000										
Oxidation Catalyst																																																																			
	TBD																																																																		
Flare/Thermal Oxidizer																																																																			
	Willexa Thermal Oxidizer	Included in Willexa Maintenance shown above.																																																																	
Unison Solutions																																																																			
	Gas Treatment Skid																																												1.00		$100,000	$100,000												1.00		$100,000	$100,000					
		Annual Consumables	Preventative maintenance: media changeout and filter maintenance. Based on manufacturers estimated average annual cost.																																	1.00		$20,000	$20,000																													
Xebec																																																																			
	Gas Treatment Skid																																																																		
		Annual Consumables	Preventative maintenance: media changeout and filter maintenance. Based on manufacturers estimated average annual cost.																																																1.00		$200,000	$200,000												1.00		$200,000	$200,000
Compression																																																																			
	ANGI Energy Gas Compression System																																																																		
		Daily Maintenance	Compressor Inspection																																					Operation and Maintenance Personnel to perform					Operation and Maintenance Personnel to perform					Operation and Maintenance Personnel to perform					Operation and Maintenance Personnel to perform					Operation and Maintenance Personnel to perform					Operation and Maintenance Personnel to perform				
		Bi-Weekly Maintenance	Check Safety Shutdowns																																					Operation and Maintenance Personnel to perform					Operation and Maintenance Personnel to perform					Operation and Maintenance Personnel to perform					Operation and Maintenance Personnel to perform					Operation and Maintenance Personnel to perform					Operation and Maintenance Personnel to perform				
		Quarterly Maintenance	Change oil filter, oil and lubricator box oil																																					Operation and Maintenance Personnel to perform					Operation and Maintenance Personnel to perform					Operation and Maintenance Personnel to perform					Operation and Maintenance Personnel to perform					Operation and Maintenance Personnel to perform					Operation and Maintenance Personnel to perform				
		Semi-Annual Maintenance	Process Valves, Cylinders, Pistons, Frame, Temperature Guage and Pressure Gauge Inspections																																					24.00	2.00	48.00	$40	$1,920	24.00	2.00	48.00	$40	$1,920	24.00	2.00	48.00	$40	$1,920	24.00	2.00	48.00	$40	$1,920	24.00	2.00	48.00	$40	$1,920	24.00	2.00	48.00	$40	$1,920
		Annual Maintenance	Process Valves, Cylinders, Pistons, Frame, Temperature Guage and Pressure Gauge Inspections																																					24.00	1.00	24.00	$40	$960	24.00	1.00	24.00	$40	$960	24.00	1.00	24.00	$40	$960	24.00	1.00	24.00	$40	$960	24.00	1.00	24.00	$40	$960	24.00	1.00	24.00	$40	$960
		Bi-Annual Maintenance	Process Valves, Compressor, and Pressure Gauge Inspections, and Compressor Bearings																																					24.00	0.50	12.00	$40	$480	24.00	0.50	12.00	$40	$480	24.00	0.50	12.00	$40	$480	24.00	0.50	12.00	$40	$480	24.00	0.50	12.00	$40	$480	24.00	0.50	12.00	$40	$480
Storage																																																																			
	ANGI Compressed Gas Storage Tanks																																																																		
		Daily Maintenance	Inspect CNG Dryer, Storage Tanks, Dispensers																																																				Operation and Maintenance Personnel to perform					Operation and Maintenance Personnel to perform					Operation and Maintenance Personnel to perform				
		Bi-Weekly Maintenance	CNG Dryer Regeneration and Inspection																																																				Operation and Maintenance Personnel to perform					Operation and Maintenance Personnel to perform					Operation and Maintenance Personnel to perform				
		Monthly Maintenance	Inspect CNG Dryer, ESD System, Relief Valves																																																				Operation and Maintenance Personnel to perform					Operation and Maintenance Personnel to perform					Operation and Maintenance Personnel to perform				
		Annual Maintenance	Replace System Filters, Inspect Relief Valves																																																				8.00	1.00	8.00	$40	$320	8.00	1.00	8.00	$40	$320	8.00	1.00	8.00	$40	$320
Generators																																																																			
	Biogas Engine Unit With Gear																																																																		
		Weekly Maintenance	Filter Elements, Blower Intake Filter, Blower Outlet Pressure Gauge, Heater Temp. Gauges, Blower Oil, Panel Heater & Air Conditioners						Operation and Maintenance Personnel to perform					Operation and Maintenance Personnel to perform					Operation and Maintenance Personnel to perform					Operation and Maintenance Personnel to perform																																														
		Quarterly Maintenance	Fuel System, Exhaust System, AC and DC Electrical Systems						Operation and Maintenance Personnel to perform					Operation and Maintenance Personnel to perform					Operation and Maintenance Personnel to perform					Operation and Maintenance Personnel to perform																																														
		Semi-Annual Maintenance	Cooling System, Exhaust System, AC and DC Electrical Systems						Operation and Maintenance Personnel to perform					Operation and Maintenance Personnel to perform					Operation and Maintenance Personnel to perform					Operation and Maintenance Personnel to perform																																														
		Annual Maintenance	Fuel System, Cooling System, Exhaust System, AC Electrical System, Alternator						Operation and Maintenance Personnel to perform					Operation and Maintenance Personnel to perform					Operation and Maintenance Personnel to perform					Operation and Maintenance Personnel to perform																																														
		Bi-Annual Maintenance	Alternator						Operation and Maintenance Personnel to perform					Operation and Maintenance Personnel to perform					Operation and Maintenance Personnel to perform					Operation and Maintenance Personnel to perform																																														
		3-Yr Maintenance	AC Electrical System						Operation and Maintenance Personnel to perform					Operation and Maintenance Personnel to perform					Operation and Maintenance Personnel to perform					Operation and Maintenance Personnel to perform																																														
		10-Yr Maintenance	Controller Battery						Operation and Maintenance Personnel to perform					Operation and Maintenance Personnel to perform					Operation and Maintenance Personnel to perform					Operation and Maintenance Personnel to perform																																														
	Micro Turbine 330 KW CHP Complete																																																																		
		Annual Maintenance	Filter Elements, Engine, Enclosures, Batteries, Switches, Ignitor, Coolants, Generator Bearings																									40.00	1.00	120.00	$40	$4,800																																				
	Capstone 600 kW MicroTurbine																																																																	
		Annual Maintenance	Contracted with Vergent Power Solutions																																	1.00		$75,000	$75,000																													
Average Subtotal Cost per Year								**$0**					**$7,000**					**$7,000**					**$7,000**					**$7,000**					**$11,800**					**$95,000**					**$85,400**					**$103,400**					**$203,400**					**$85,700**					**$103,700**					**$203,700**
Personnel [4]																																																																			
	Operator									1.00		$80,000	$80,000		1.00		$80,000	$80,000		1.00		$80,000	$80,000		1.00		$80,000	$80,000		1.00		$80,000	$80,000																																		
	Maintenance									1.00		$40,000	$40,000		1.00		$40,000	$40,000		1.00		$40,000	$40,000		1.00		$40,000	$40,000		1.00		$40,000	$40,000							1.50		$40,000	$60,000		1.50		$40,000	$60,000							1.50		$40,000	$60,000		1.50		$40,000	$60,000					
Wellfield Operation [5]																																																																			
	Wellfield Monitoring				1.00		$14,400	$14,400		0.00		$14,400	$0		0.00		$14,400	$0		0.00		$14,400	$0		0.00		$14,400	$0		0.00		$14,400	$0		1.00		$14,400	$14,400		0.00		$14,400	$0		0.00		$14,400	$0		1.00		$14,400	$14,400		0.00		$14,400	$0		0.00		$14,400	$0		1.00		$14,400	$14,400
	System Equipment/Supplies				1.00		$10,000	$10,000		1.00		$10,000	$10,000		1.00		$10,000	$10,000		1.00		$10,000	$10,000		1.00		$10,000	$10,000		1.00		$10,000	$10,000		1.00		$10,000	$10,000		2.00		$10,000	$20,000		2.00		$10,000	$20,000		2.00		$10,000	$20,000		2.00		$10,000	$20,000		2.00		$10,000	$20,000		2.00		$10,000	$20,000
	Contractor Services				1.00		$8,800	$8,800		1.00		$8,800	$8,800		1.00		$8,800	$8,800		1.00		$8,800	$8,800		1.00		$8,800	$8,800		1.00		$8,800	$8,800		1.00		$8,800	$8,800		2.00		$8,800	$17,600		2.00		$8,800	$17,600		2.00		$8,800	$17,600		2.00		$8,800	$17,600		2.00		$8,800	$17,600		2.00		$8,800	$17,600
	Staff Time				1.00		$36,000	$36,000		0.00		$36,000	$0		0.00		$36,000	$0		0.00		$36,000	$0		0.00		$36,000	$0		0.00		$36,000	$0		1.00		$36,000	$36,000		0.00		$36,000	$0		0.00		$36,000	$0		1.00		$36,000	$36,000		0.00		$36,000	$0		0.00		$36,000	$0		1.00		$36,000	$36,000
Regulatory Costs																																																																			
	Regulatory Sampling and Reporting				1.00		$7,500	$7,500		1.00		$7,500	$7,500		1.00		$7,500	$7,500		1.00		$7,500	$7,500		1.00		$7,500	$7,500		1.00		$7,500	$7,500		1.00		$7,500	$7,500		1.00		$7,500	$7,500		1.00		$7,500	$7,500		1.00		$7,500	$7,500		1.00		$7,500	$7,500		1.00		$7,500	$7,500		1.00		$7,500	$7,500
	Regulatory Emissions Fees				0.00		$6,500	$0		1.00		$6,500	$6,500		1.00		$6,500	$6,500		1.00		$6,500	$6,500		1.00		$6,500	$6,500		1.00		$6,500	$6,500		1.00		$6,500	$6,500		0.00		$6,500	$0		0.00		$6,500	$0		0.00		$6,500	$0		0.00		$6,500	$0		0.00		$6,500	$0		0.00		$6,500	$0
Average Total Cost per Year								**$76,700**					**$159,800**					**$159,800**					**$159,800**					**$159,800**					**$164,600**					**$178,200**					**$190,500**					**$208,500**					**$298,900**					**$190,800**					**$208,800**					**$299,200**
Average O&M Cost Increase per Year								**-$6,500**					**$76,600**					**$76,600**					**$76,600**					**$76,600**					**$81,400**					**$95,000**					**$107,300**					**$125,300**					**$215,700**					**$107,600**					**$125,600**					**$216,000**

Notes:
1. CHP=Combined Heat Processes
2. Pipeline option does not include infrastructure beyond site entrance.
3. Average total cost per year will vary depending on the maintenance events occuring during any given year.
4. Assumed Personnel will perform all maintenance for Electrical Generation Equipment, except as noted above.
5. Unit Cost for Wellfield Operation Items based on actual Annual Budget amounts. Frequency increased as necessary
6. Untreated Pipeline Option assumes Liberty Utilities responsible for O&M Costs.